

embodiments, the first pair of inclined planes meet the second pair of inclined planes at a first point and a second point.

[0010] In some embodiments, the cam surface and the following surface can be designed such that following surface is at least partially received in the follower receptacle before any of the plurality of insert contacts engage any of the plurality of contacts of the connector receptacle. In some embodiments, the implantable blood pump system can include a seal extending around the receptacle connector, which seal can seal with the connector insert when the connector insert is received within the connector receptacle.

[0011] In some embodiments, the connector insert further includes a locking mechanism. In some embodiments, the locking mechanism can include at least one locking feature and at least one control feature coupled to the at least one locking feature. In some embodiments, the at least one locking feature can include a wedge-shaped member. In some embodiments, the at least one control feature can include a button.

[0012] In some embodiments, the at least one locking feature includes an abutting surface. In some embodiments, the connector receptacle can include a securement feature including a depression and a stop wall. In some embodiments, the stop wall can engage the abutting surface of the locking mechanism when the connector insert is received within the connector receptacle.

[0013] In some embodiments, the implantable blood pump system includes a locking member extending at least partially around the connector receptacle. In some embodiments, the locking member includes a channel in which the connector receptacle is at least partially received. In some embodiments, the locking member is rotatable about the connector receptacle. In some embodiments, the locking member selectively engages with the following surface of the connector insert to retain the at least a portion of the following surface within the follower receptacle. In some embodiments, the following surface includes a key and a circular cylindrical member extending from a side of the connector insert.

[0014] In some embodiments, the locking member includes a blocking feature that can engage with at least a portion of the following surface to prevent retraction of the connector insert from the connector receptacle. In some embodiments, the locking member includes a biasing feature that can bias the blocking feature to engage with the at least a portion of the following surface. In some embodiments, the blocking feature engages with the circular cylindrical member. In some embodiments, the biasing feature includes a compliant member that can deflect to allow the blocking feature to engage and disengage with the at least a portion of the following surface. In some embodiments, the inserting of the connector insert into the connector receptacle deflects the compliant member and rotates the locking member about the connector receptacle.

[0015] One aspect of the present disclosure relates to a medical device. The medical device can include: a housing having an external surface defining an internal volume, and a connector receptacle located in the housing. The connector receptacle can receive a connector insert. The connector receptacle can include a side wall extending from the external surface of the housing into the internal volume and to a bottom of the connector receptacle. In some embodiments, the side wall and the bottom together define a

receptacle volume having an opening proximate to the external surface of the housing. The connector receptacle can include a plurality of electrical contacts that mate with corresponding contacts of a connector insert when the connector insert is coupled with the connector receptacle. The connector receptacle can include an orientation feature that engages with at least one mating feature of the connector insert to move the connector insert to a desired alignment with respect to the connector receptacle while the connector insert is inserted into the connector receptacle.

[0016] In some embodiments, the orientation feature can be a key extending from the side wall into the receptacle volume. In some embodiments, the key can engage an alignment cam on the connector insert. In some embodiments, the key can be received within a key slot on the connector insert when the connector insert is at the desired alignment with respect to the connector receptacle and fully received within the receptacle volume. In some embodiments, the key can be a pointed key having a point. In some embodiments, the point of the pointed key engages with the alignment cam when the connector insert is inserted into the connector receptacle.

[0017] In some embodiments, the plurality of electrical contacts are on the bottom of the connector receptacle. In some embodiments, the plurality of electrical contacts are arranged in a ring on the bottom of the connector receptacle. In some embodiments, the medical device can include a seal that can sealingly mate with at least a portion of the connector insert when the connector insert is received within the connector receptacle. In some embodiments, the medical device can include a seal that can provide an environmental barrier when mating with at least a portion of the connector insert when the connector insert is received within the connector receptacle. In some embodiments, the seal extends around the opening of the receptacle volume. In some embodiments, the medical device can be at least one of: a controller; an implantable blood pump; and a power source.

[0018] One aspect of the present disclosure relates to a method of coupling an implantable blood pump system. The method includes: contacting a mating feature of a connector insert to an orientation feature of a connector receptacle, advancing the connector insert into the connector receptacle, reorienting the connector insert from the first orientation to a second orientation via interaction between the orientation feature of the connector receptacle and the mating feature of the connector insert as the connector insert advances into the connector receptacle, and mating insert contacts with connector contacts. In some embodiments, the connector insert has a first orientation when advanced into the connector receptacle.

[0019] In some embodiments, the orientation feature can include a key extending from the side wall into the receptacle volume. In some embodiments, the key can engage an alignment cam on the connector insert. In some embodiments, the method includes receiving a key in a key slot on the connector insert when the connector insert is reoriented to the second orientation. In some embodiments, the key can be a pointed key having a point. In some embodiments, the point of the pointed key interacts with the mating feature of the connector insert to reorient the connector insert from the first orientation to the second orientation.

[0020] In some embodiments, the mating feature includes a pair of inclined planes wrapping around at least a portion